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Notice of Allowability

Application No.

10/699,077

Examiner

Hai Vo

Applicant(s)

ROSS, LESLIE

Art Unit

1771

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed 11/21/2006.
2. ☒ The allowed claim(s) is/are 16,17,20,21,23 and 26.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input checked="" type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date <u>20061218</u> . |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____ |

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Jay Franklin on 12/18/2006.

The application has been amended as follows:

The claims:

16. (CURRENTLY AMENDED) A composite sheet material comprising:

a rigid core (34) of honeycomb cellular material having a first and a second side and an initial thickness; and the rigid core (34) being formed of a plurality of individually extruded tubes arranged adjacently and in parallel and in a hexagonal pattern to form a honeycomb structure in which each tube has a first end in contact with a first side skin and a second end in contact with a second side skin;

the first skin is formed of continuous sheet material on the first side of the rigid core and the second skin is formed of continuous sheet material on the second side of the rigid core and the first and the second skins each have an initial thickness; and

the first and the second skins (32, 36) are formed of a reinforced thermoplastic laminate thermoformable in a temperature range of 150°C to 300°C; and

the tubes are formed of polyetherimid material thermoformable in a temperature range up to 170°C; and

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~~a panel~~ the composite sheet material being formed of the rigid core (34) and the first and the second skins (32,36) is uniformly compressed while heated to a temperature in a thermoformable range of 150°C to 170°C so as to have a uniform thickness less than a sum of the initial thicknesses of the rigid core (34), the first side skin (32) and the second side skin (36); ~~whereby~~

wherein in each tube, regions of a wall of the tube adjacent ~~only~~ the first and second ends of the tube are distorted ~~symmetrically about a longitudinal axis of the tube by an amount~~ so as to bridge interstices between the first ends and the second ends of each of adjacent ones of the tubes to thereby increase the contact surface area between the tube and the first side and the second side skins and walls.

21. (CURRENTLY AMENDED) A composite sheet material comprising:

a rigid core (12, 34) of honeycomb cellular material having an initial thickness and being formed by a plurality of individually extruded tubes arranged adjacently and in parallel and in a hexagonal pattern to form a honeycomb; and

a first skin of continuous sheet material on a first side of the rigid core (12, 34) and a second skin of continuous sheet material on a second side of the rigid core, and the first skin (14, 32) and the second skin (16, 36) each have an initial thickness;

wherein each tube has a first end in contact with a first side skin and a second end in contact with a second side skin;

the tubes are formed of polyetherimid material thermoformable in a temperature range up to 170°C;

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the first and the second skins (14, 16; 32, 36) are formed of a reinforced thermoplastic laminate thermoformable in a temperature range of 150°C to 300°C; and the first and the second skins (14, 16; 32, 36) are each attached to a corresponding side of the rigid core by a polyester base thermoplastic adhesive having a fusion temperature less than 150°C; and

~~a panel~~ the composite sheet material formed of the rigid core, the first and the second skins is uniformly compressed, while heated to a temperature in a thermoformable range of 150°C to 170°C, so as to have a uniform thickness less than a sum of the initial thicknesses of the rigid core and the first and second skins so that in each tube, regions of a wall of the tube adjacent ~~only~~ the first and second ends of the tube are distorted ~~symmetrically about a longitudinal axis of the tube by an amount~~ so as to bridge interstices between the first ends and the second ends of each of adjacent ones of the tubes to thereby increase the contact surface area between the tube and the first side and second side skins and walls.

26. (CURRENTLY AMENDED) A composite sheet material comprising:

a rigid core (34) of honeycomb cellular material having a first side and a second side and an initial thickness and formed of a plurality of individually extruded tubes arranged adjacently and in parallel and in a hexagonal pattern to form a honeycomb with each tube extending from a first end at the first side to a second end at the second side; and

a first skin of continuous sheet material on the first side and a second skin of continuous sheet material on the second side of side, with the first and the second skins each having an initial thickness;

wherein the tubes are formed of polyetherimid material thermoformable in a temperature range of 150°C to 170°C; and

the first and the second skins are formed of a reinforced thermoplastic laminate thermoformable in a temperature range of approximately 170° to 300°C; and

in each tube, regions of a wall of the tube adjacent ~~only~~ the first and second ends of the tube are distorted ~~symmetrically about a longitudinal axis of the tube~~ by an amount so as to bridge interstices between the first ends and the second ends of each of adjacent ones of the tubes to thereby increase the contact surface area between the tube and the first side and second side skins and walls, wherein the composite sheet material has a uniform thickness.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: Note that Applicant's amendment and Examiner's amendment are sufficient to overcome the art rejections and sufficient to place the instant claims in condition for allowance.

Of the references of record, the most pertinent are Kaufmann et al (US 5,484,500), Byma (US 6,413,613), Heitkamp (US 4,956,217) and Effing et al (US 5,238,725).

Kaufmann teaches a structural panel having a core material with thermoplastic resin facings. Kaufmann discloses that the core material is a honeycomb structure from

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aramid paper and the facings made from PEKK and glass fibers. Kaufmann teaches the panel heated to a temperature from 480°F to 710°F or 249°C to 377°C in the belt press for a residence time of less than 2.3 min (column 1, lines 30-40). Effing evidences that when the processing temperatures for facesheets (PEKK/glass) are in the range of 250°C to 350°C, the temperatures in the core center will be in the range of 190 °C to 320 °C for the heating time from 2 to 2.5 min. Kaufman teaches that "with the new thermoplastic facing technology, the core is heated above its softening point such that the cells are crushed much more uniformly than with conventional thermoset crushed-core panels which have considered cell damage after panel fabrication leading to a decrease in bending stiffness". Likewise, Kaufmann teaches away from the use of the core with considered cell damage after panel fabrication. Heitkamp teaches a fire retardant composite structure for use in aircraft applications including a honeycomb core with thermoplastic resin facings. Heitkamp discloses the honeycomb core could be an aramid paper or a tubular cellular polyetherimid material. Those skilled in the art would not have been motivated to replace the aramid paper of Kaufmann with Heitkamp's tubular cellular polyetherimid material which is thermoformable in a temperature range of 150°C to 170°C because to do so would defeat the objectives of Kaufmann. Exposing the tubular polyetherimid core above its thermoformable temperatures will not allow the core flexibility for the shaping but rather provides significantly degraded cell structures.

Byma teaches a headliner comprising a rigid core of polyetherimid honeycomb cellular material with decorative coverings. Byma teaches the headliner having a non-

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uniform thickness as a result of the molding operation as shown in figures 3 and 6.

Byrna discloses variation of the headliner thickness and permanent deformation provide the headliner with different sections having different energy management properties (column 12, lines 7-40).

Note that, none of the cited art, alone or in combination, teaches or suggests a composite sheet material as recited by the claims. Accordingly, the instant claims are deemed allowable.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai Vo whose telephone number is (571) 272-1485. The examiner can normally be reached on Monday through Thursday, from 9:00 to 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HV

Hai Vo

**HAI VO
PRIMARY EXAMINER**